

| | |
|----------|----------------------|
| Location | CV Hwy at Garces Hwy |
| X | 288000 |
| Y | 3959800 |

| Symbol | Parameter | Value | Units |
|---------------|---------------------------------------|-----------|----------------------|
| z_i | Depth, injection zone | 2574 | m |
| z_u | Depth, USDW | 626 | m |
| TDS,i | TDS, injection zone | 25000 | mg/L |
| TDS,u | TDS, USDW | 500 | mg/L |
| T | Average surface temperature | 18.9 | C |
| ΔT | Geothermal Gradient | 25 | C/km |
| g | Gravitational constant | 9.81 | m/s ² |
| λ | Density gradient at constant TDS | -1.23E-05 | kg/L*m |
| | | -1.23E-02 | kg/m ³ *m |
| ξ | Initial density gradient in borehole | -2.99E-06 | kg/L*m |
| | | -2.99E-03 | kg/m ³ *m |
| $\Delta \rho$ | Final density difference at USDW base | 0.018 | kg/L |
| | | 18.11 | kg/m ³ |
| ΔP | Maximum admissible pressure | 173043 | Pa |

| Depth (m) | T, °C | A | B | Rho (kg/m ³) | ρ , TDS = 500 mg/L (kg/L) | ρ , TDS = 25,000 mg/L (kg/L) |
|-----------|-------|------|--------|--------------------------|--------------------------------|-----------------------------------|
| 500 | 31.4 | 0.75 | -0.004 | 995.247 | 0.996 | 1.014 |
| 750 | 37.7 | 0.75 | -0.004 | 993.125 | 0.993 | 1.012 |
| 1000 | 43.9 | 0.74 | -0.004 | 990.700 | 0.991 | 1.009 |
| 1250 | 50.2 | 0.74 | -0.005 | 987.995 | 0.988 | 1.006 |
| 1500 | 56.4 | 0.74 | -0.005 | 985.030 | 0.985 | 1.003 |
| 1750 | 62.7 | 0.75 | -0.006 | 981.821 | 0.982 | 1.000 |
| 2000 | 68.9 | 0.76 | -0.007 | 978.378 | 0.979 | 0.997 |
| 2250 | 75.2 | 0.77 | -0.007 | 974.714 | 0.975 | 0.993 |
| 2500 | 81.4 | 0.79 | -0.008 | 970.836 | 0.971 | 0.990 |
| 2750 | 87.7 | 0.81 | -0.009 | 966.751 | 0.967 | 0.986 |
| USDW | 626 | 34.6 | 0.75 | 994.217 | 0.995 | 1.013 |
| Injection | 2574 | 83.3 | 0.80 | -0.009 | 969.648 | 0.970 |
| | | | | | | 0.989 |

Earthward Consulting, 2016

Water density as function of temperature and concentration

McCutcheon, S.C., Martin, J.L., Barnwell, T.O. Jr. 1993. Water Quality in Maidment, D.R. (Editor). Handbood of Hydrology, McGraw-Hill, New York, NY (p. 11.3.)

Water density as a function of temperature only

rho = density in kg/m³ as a function of temperature

T = temperature in C

$$\rho = 1000(1 - (T+288.9414)/(508929.2*(T+68.12963))*(T-3.9863)^2)$$

Water density as a function of temperature and salinity

rhos = density in kg/m³ as a function of temperature and salinity

S = salinity in g/kg

$$\rho = \rho_0 + AS + BS^{(3/2)} + CS^2$$

$$A = 8.24493E-1 - 4.0899E-3*T + 7.6438E-5*T^2 - 8.2467E-7*T^3 + 5.3675E-9*T^4$$

$$B = -5.724E-3 + 1.0227E-4*T - 1.6546E-6*T^2$$

$$C = 4.8314E-4$$

